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Document Number: DSP1027

Date: 2009-12-14

Version: 2.0.0

5 **Power State Management Profile**

6 **Document Type: Specification**
7 **Document Status: DMTF Standard**
8 **Document Language: E**
9

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Foreword

106 The *Power State Management Profile* (DSP1027) was prepared by the Physical Platform Profiles Working
107 Group and the Server Management Working Group of the DMTF.

108 DMTF is a not-for-profit association of industry members dedicated to promoting enterprise and systems
109 management and interoperability.

110 **Acknowledgments**

111 The authors wish to acknowledge the following people.

112 **Editors:**

- 113 • Hemal Shah – Broadcom Corporation
- 114 • RadhaKrishna R. Dasari – Dell
- 115 • Jeff Hilland – HP

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- 121 • Aaron Merkin – IBM
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- 123 • Jeff Hilland – HP
- 124 • Christina Shaw – HP
- 125 • Perry Vincent – Intel
- 126 • John Leung – Intel
- 127 • Mike Dutch – Symantec
- 128 • Hemal Shah – Broadcom Corporation

129

Introduction

130 The information in this specification should be sufficient for a provider or consumer of this data to identify
131 unambiguously the classes, properties, methods, and values that must be instantiated and manipulated to
132 describe and control the power state and hardware management for a computer system using the DMTF
133 Common Information Model (CIM) core and extended model definitions. The target audience for this
134 specification is implementers who are writing CIM-based providers or consumers of management
135 interfaces that represent the component described in this document.

136

Power State Management Profile

137 1 Scope

138 The *Power State Management Profile* describes the classes, associations, properties, and methods used
139 to manage the power of a computer system.

140 2 Normative References

141 The following referenced documents are indispensable for the application of this document. For dated
142 references, only the edition cited applies. For undated references, the latest edition of the referenced
143 document (including any amendments) applies.

144 *Advanced Configuration and Power Interface Specification*, 3.0, September 2, 2004,
145 <http://www.acpi.info/Downloads/ACPIspec30.pdf>

146 DMTF DSP0004, *CIM Infrastructure Specification 2.5*,
147 http://www.dmtf.org/standards/published_documents/DSP0004_2.5.pdf

148 DMTF DSP0200, *CIM Operations over HTTP 1.3*,
149 http://www.dmtf.org/standards/published_documents/DSP0200_1.3.pdf

150 DMTF DSP1001, *Management Profile Specification Usage Guide 1.0*,
151 http://www.dmtf.org/standards/published_documents/DSP1001_1.0.pdf

152 DMTF DSP1033, *Profile Registration Profile 1.0*,
153 http://www.dmtf.org/standards/published_documents/DSP1033_1.0.pdf

154 ISO, ISO/IEC Directives, Part 2, *Rules for the structure and drafting of International Standards*,
155 <http://isotc.iso.org/livelink/livelink.exe?func=ll&objId=4230456&objAction=browse&sort=subtype>

156 3 Terms and Definitions

157 For the purposes of this document, the terms and definitions in [DSP1033](#) and [DSP1001](#) and the following
158 terms and definitions apply.

159 3.1

160 **can**

161 used for statements of possibility and capability, whether material, physical, or causal

162 3.2

163 **cannot**

164 used for statements of possibility and capability, whether material, physical, or causal

165 3.3

166 **conditional**

167 indicates requirements to be followed strictly in order to conform to the document when the specified
168 conditions are met

- 169 **3.4**
170 **mandatory**
171 indicates requirements to be followed strictly in order to conform to the document and from which no
172 deviation is permitted
- 173 **3.5**
174 **may**
175 indicates a course of action permissible within the limits of the document
- 176 **3.6**
177 **need not**
178 indicates a course of action permissible within the limits of the document
- 179 **3.7**
180 **optional**
181 indicates a course of action permissible within the limits of the document
- 182 **3.8**
183 **referencing profile**
184 indicates a profile that owns the definition of this class and can include a reference to this profile in its
185 "Referenced Profiles" table
- 186 **3.9**
187 **shall**
188 indicates requirements to be followed strictly in order to conform to the document and from which no
189 deviation is permitted
- 190 **3.10**
191 **shall not**
192 indicates requirements to be followed strictly in order to conform to the document and from which no
193 deviation is permitted
- 194 **3.11**
195 **should**
196 indicates that among several possibilities, one is recommended as particularly suitable, without
197 mentioning or excluding others, or that a certain course of action is preferred but not necessarily required
- 198 **3.12**
199 **should not**
200 indicates that a certain possibility or course of action is deprecated but not prohibited
- 201 **3.13**
202 **unspecified**
203 indicates that this profile does not define any constraints for the referenced CIM element or operation
- 204 **3.14**
205 **Immediate Power State Change**
206 indicates the power state transition that will be initiated immediately
- 207 **3.15**
208 **Pending Power State Change**
209 indicates the power state transition that will be initiated sometime in the future

210 **4 Symbols and Abbreviated Terms**

211 The following abbreviations are used in this document.

212 **4.1**

213 **ACPI**

214 Advanced Configuration and Power Interface

215 **4.2**

216 **CIM**

217 Common Information Model

218 **5 Synopsis**

219 **Profile Name:** Power State Management

220 **Version:** 2.0.0

221 **Organization:** DMTF

222 **CIM Schema Version:** 2.23

223 **Central Class:** CIM_PowerManagementService

224 **Scoping Class:** CIM_ComputerSystem

225 The *Power State Management Profile* extends the management capability of the referencing profiles by
 226 adding the capability to describe and manage the power state of computer systems.

227 CIM_PowerManagementService shall be the Central Class of this profile. The instance of
 228 CIM_PowerManagementService shall be the Central Instance of this profile. CIM_ComputerSystem shall
 229 be the Scoping Class of this profile. The instance of CIM_ComputerSystem with which the Central
 230 Instance is associated through an instance of CIM_HostedService shall be the Scoping Instance of this
 231 profile.

232 Table 1 identifies profiles on which this profile has a dependency.

233 **Table 1 – Related Profiles**

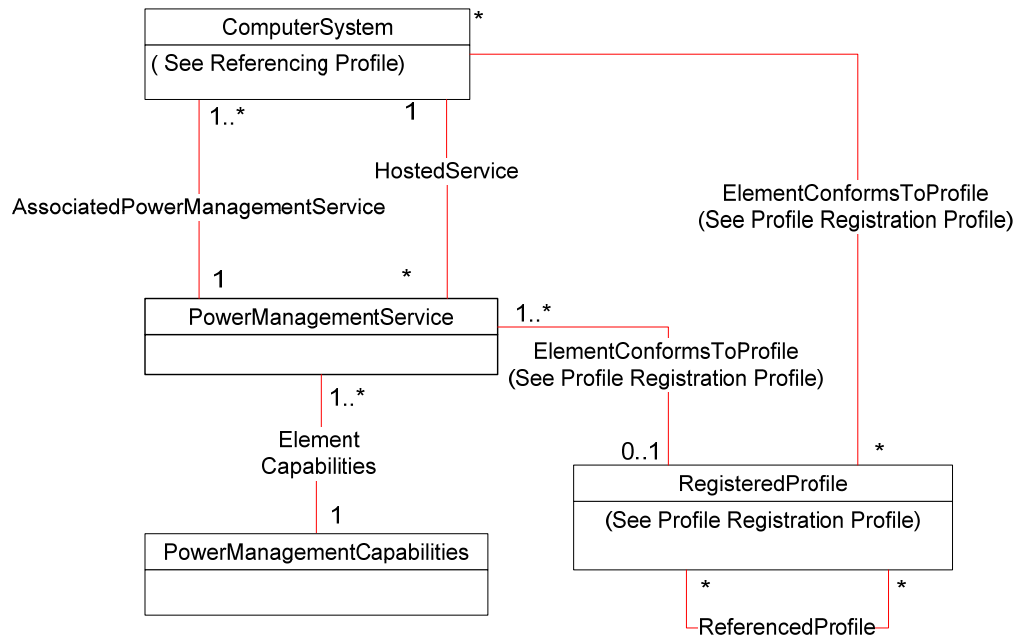
Profile Name	Organization	Version	Requirement	Description
Profile Registration	DMTF	1.0	Mandatory	

234 **6 Description**

235 The *Power State Management Profile* defines the behavior of the power management service and related
 236 classes used to describe and control power state and hardware reset management for a computer
 237 system. The profile describes the classes, property values, and methods that constitute a Pending Power
 238 State Change and an Immediate Power State Change.

239 The CIM_ComputerSystem class is not part of this profile but is shown for clarification in all the class and
 240 instance diagrams.

241 Figure 1 represents the class schema of the *Power State Management Profile* and shows the elements of
 242 the *Power State Management Profile*, as well as the dependent relationships between the elements of
 243 *Power State Management Profile* and the referencing profiles. For simplicity, the prefix CIM_ has been
 244 removed from the names of the classes.



245

246

Figure 1 – Power State Management Profile: Class Diagram

247 7 Implementation

248 This section details the requirements related to the arrangement of instances and their properties for
 249 implementations of this profile. Methods are listed in section 8 (“Methods”), and properties are listed in
 250 section 10 (“CIM Elements”).

251 7.1 CIM_PowerManagementService

252 At least one instance of CIM_PowerManagementService shall be associated with one or more instances
 253 of CIM_ComputerSystem through an instance of CIM_AssociatedPowerManagementService. The
 254 managed system that is hosting the power management service, represented by an instance of
 255 CIM_ComputerSystem, shall be associated with CIM_PowerManagementService through the
 256 CIM_HostedService association.

257 7.1.1 CIM_PowerManagementService.ElementName

258 The ElementName property shall be formatted as a free-form string of variable length (pattern “..*”).

259 7.2 CIM_PowerManagementCapabilities

260 One CIM_PowerManagementCapabilities instance shall be associated with one or more instances of
 261 CIM_PowerManagementService through the CIM_ElementCapabilities association.

262 **7.2.1 CIM_PowerManagementCapabilities.PowerChangeCapabilities**

263 The PowerChangeCapabilities property array is used to represent the power state related capabilities of
 264 the instances of CIM_ComputerSystem associated with the CIM_PowerManagementService instances
 265 with which the CIM_PowerManagementCapabilities instance is associated. This property is also used to
 266 indicate support for client management of the power state through the
 267 CIM_PowerManagementService.RequestPowerStateChange() method. When the
 268 RequestPowerStateChange() method is supported, the PowerChangeCapabilities property array shall
 269 contain the value 3 (Power State Settable).

270 When the PowerStatesSupported property contains the value in the “PowerStatesSupported Value”
 271 column, the PowerChangeCapabilities property shall contain the value specified in the
 272 “PowerChangeCapabilities Value” column.

273 **Table 2 – PowerStatesSupported and PowerChangeCapabilities Values**

PowerStatesSupported Value	PowerChangeCapabilities Value
5 (Power Cycle (Off - Soft))	4 (Power Cycling Supported)
9 (Power Cycle (Off-Hard))	6 (Off Hard Power Cycling Supported)
10 (Master Bus Reset)	7 (HW Reset Supported)
11 (Diagnostic Interrupt (NMI))	7 (HW Reset Supported)
12 (Off - Soft Graceful)	8 (Graceful Shutdown Supported)
13 (Off - Hard Graceful)	8 (Graceful Shutdown Supported)
14 (Master Bus Reset Graceful)	7 (HW Reset Supported) and 8 (Graceful Shutdown Supported)
15 (Power Cycle (Off - Soft Graceful))	4 (Power Cycling Supported) and 8 (Graceful Shutdown Supported)
16 (Power Cycle (Off - Hard Graceful))	6 (Off Hard Power Cycling Supported) and 8 (Graceful Shutdown Supported)

274 **7.2.2 CIM_PowerManagementCapabilities.ElementName**

275 The ElementName property shall be formatted as a free-form string of variable length (pattern “.*”).

276 **7.2.3 CIM_PowerManagementCapabilities.PowerStatesSupported**

277 The PowerStatesSupported property array is used to represent the power states that are supported by
 278 the associated computer system.

279 **7.2.4 CIM_PowerManagementCapabilities.RequestedPowerStatesSupported**

280 The RequestedPowerStatesSupported property is an array that contains the supported requested power
 281 states for the instance of CIM_PowerManagementService. This property shall contain the values to be
 282 used as the PowerState parameter in the RequestPowerStateChange() (see 8.1). This property
 283 represents a subset of the power states modeled by the property PowerStatesSupported.

284 **7.3 CIM_AssociatedPowerManagementService.PowerState**

285 The PowerState property indicates the current power state of the associated computer system
 286 represented by an instance of CIM_ComputerSystem. The PowerState property shall have one of the
 287 values specified in the PowerStatesSupported property of the instance of
 288 CIM_PowerManagementCapabilities that is associated with the instance of

289 CIM_PowerManagementService that is referenced by the CIM_AssociatedPowerManagementService
290 association.

291 The RequestPowerStateChange() method of the CIM_PowerManagementService shall be used to
292 change the value of the PowerState property.

293 7.3.1 Power States Values

294 Table 3 specifies the correspondence between CIM_AssociatedPowerManagementService.PowerState
295 property values and standard ACPI power states. The value of the PowerState property shall have the
296 same meaning as the corresponding ACPI state in Table 3. Note that it is not necessary for the managed
297 system to actually support the ACPI specification. The PowerState values not represented in Table 3 do
298 not have any corresponding ACPI power states.

299 **Table 3 – PowerState Values and ACPI States**

PowerState enum Value	Description	Corresponding ACPI State
2 (On)	System is fully on.	G0 (S0)
3 (Sleep - Light)	System is in Standby or Sleep state.	G1 (S1 or S2)
4 (Sleep -Deep)	System is in Standby or Sleep state.	G1 (S3)
6 (Off - Hard)	System is powered off except for the real-time clock, power consumption is zero.	G3
7 (Hibernate (Off - Soft))	System is in hibernation. System context and OS image was written to non-volatile storage. System and devices are powered off.	G1 (S4)
8 (Off - Soft)	System is powered off where the system consumes a minimal amount of power..	G2 (S5)

300 7.4 Representing Power State Changes

301 The CIM_AssociatedPowerManagementService.RequestedPowerState property indicates the requested
302 power state of the associated computer system.

303 The CIM_AssociatedPowerManagementService.PowerOnTime property indicates the date-time that the
304 power state change indicated by the RequestedPowerState property was or will be initiated. When the
305 PowerOnTime property is non-Null, the value shall be a date-time and shall not specify a time interval. A
306 value of Null for the PowerOnTime property shall indicate that the last power state change was initiated
307 immediately or shall indicate that the last requested time to initiate the power state change is unknown.

308 When the Pending Power State Change exists for the instance of CIM_ComputerSystem that is
309 referenced by the CIM_AssociatedPowerManagementService association, the RequestedPowerState
310 property shall have the value of 2 (On), 3 (Sleep - Light), 4 (Sleep -Deep), 5 (Power Cycle (Off - Soft)), 6
311 (Off - Hard), 7 (Hibernate (Off - Soft)), 8 (Off - Soft), 9 (Power Cycle (Off-Hard)), 10 (Master Bus Reset),
312 11 (Diagnostic Interrupt (NMI)), 12 (Off - Soft Graceful), 13 (Off - Hard Graceful), 14 (Master Bus Reset
313 Graceful), 15 (Power Cycle (Off - Soft Graceful)), or 16 (Power Cycle (Off - Hard Graceful)) and the value
314 of the PowerOnTime property shall identify a date-time in the future.

315 When a Power State Change is in progress for the instance of CIM_ComputerSystem that is referenced
316 by the CIM_AssociatedPowerManagementService association, the TransitioningToPowerState property
317 shall have the value of 2 (On), 3 (Sleep - Light), 4 (Sleep -Deep), 5 (Power Cycle (Off - Soft)), 6 (Off -
318 Hard), 7 (Hibernate (Off - Soft)), 8 (Off - Soft), 9 (Power Cycle (Off-Hard)), 10 (Master Bus Reset), 11
319 (Diagnostic Interrupt (NMI)), 12 (Off - Soft Graceful), 13 (Off - Hard Graceful), 14 (Master Bus Reset
320 Graceful), 15 (Power Cycle (Off - Soft Graceful)), or 16 (Power Cycle (Off - Hard Graceful)).

321 The RequestedPowerState, TransitioningToPowerState, and PowerOnTime properties are affected by
322 the invocation of the CIM_PowerManagementService.RequestPowerStateChange() method; see 8.1.

323 **7.5 Representing In-Progress Power State Transitions**

324 The representation of In-Progress power state transitions can be optionally supported. The
325 TransitioningToPowerState property is used to represent current power state transition in progress.

326 If the In-Progress power state transitions are not modeled, then the
327 CIM_AssociatedPowerManagementService.TransitioningToPowerState property shall be NULL.

328 If the In-Progress power state transitions are modeled, then the
329 AssociatedPowerManagementService.TransitioningToPowerState shall be non-NULL.

330 If the CIM_AssociatedPowerManagementService.TransitioningToPowerState is non-NULL, and a power
331 state transition is not in progress, the
332 CIM_AssociatedPowerManagementService.TransitioningToPowerState property shall have the value 19
333 (No Change).

334 If the CIM_AssociatedPowerManagementService.TransitioningToPowerState is non-NULL, does not
335 have the value 19 (No Change) which represents a state transition in progress, the
336 CIM_AssociatedPowerManagementService.PowerState property shall have the value 0 (Unknown).

337 **7.6 Representing Available Requested Power States**

338 The representation of available requested power states can be optionally supported. The
339 AvailableRequestedPowerStates property is an array that contains the currently available power states
340 that can be used as the PowerState parameter of the
341 CIM_PowerManagementService.RequestPowerStateChange() method for the instance of
342 CIM_PowerManagementService.

343 If available requested power states are not modeled, then the
344 CIM_AssociatedPowerManagementService.AvailableRequestedPowerStates property shall be NULL.

345 If available requested power states are modeled, then the
346 CIM_AssociatedPowerManagementService.AvailableRequestedPowerStates property shall be non-
347 NULL.

348 If CIM_AssociatedPowerManagementService.AvailableRequestedPowerStates is non-NULL, it shall
349 contain zero or more of the values contained in the
350 CIM_PowerManagementCapabilities.RequestedPowerStatesSupported property of the instance of
351 CIM_PowerManagementCapabilities associated with the CIM_PowerManagementService instance,
352 where zero number of values indicates that there are no available requested power states.

353 The CIM_AssociatedPowerManagementService.AvailableRequestedPowerStates shall not contain any
354 values that are not contained in the
355 CIM_PowerManagementCapabilities.RequestedPowerStatesSupported property of the instance of
356 CIM_PowerManagementCapabilities associated with the CIM_PowerManagementService instance.

357 Each value shall be contained in the
358 CIM_AssociatedPowerManagementService.AvailableRequestedPowerStates property only if an
359 invocation of the CIM_PowerManagementService.RequestPowerStateChange() method where the
360 PowerState parameter equals the value would complete successfully.

361 8 Methods

362 This section details the requirements for supporting intrinsic operations and extrinsic methods for the CIM
363 elements defined by this profile.

364 8.1 CIM_PowerManagementService.RequestPowerStateChange()

365 The RequestPowerStateChange() method is used to set the power state that the user wants for the
366 target computer system and when that system should be put into the new state. The
367 PowerChangeCapabilities property array of the associated instance of
368 CIM_PowerManagementCapabilities is used to represent the capabilities of the
369 RequestPowerStateChange() method. When this method is supported, the PowerChangeCapabilities
370 property shall contain the value 3 (Power State Settable).

371 RequestPowerStateChange() method return code values shall be as specified in Table 4.
372 RequestPowerStateChange() method parameters are specified in Table 5.

373 Invoking the RequestPowerStateChange() method multiple times could result in earlier requests being
374 overwritten or lost.

375 No standard messages are defined for this method.

376 **Table 4 – CIM_PowerManagementService.RequestPowerStateChange() Method: Return Code**
377 **Values**

Value	Description
0	The initiation of Pending/Immediate Power State Change was successful.
1	Method is not supported in the implementation.
2	Error occurred
4096	Job started: REF returned to started CIM_ConcreteJob

378 **Table 5 – CIM_PowerManagementService.RequestPowerStateChange() Method: Parameters**

Qualifiers	Name	Type	Description/Values
IN	PowerState	uint16	See 8.1.3.
IN	ManagedElement	CIM_ComputerSystem REF	See 8.1.4.
IN	Time	Datetime	See 8.1.5.
OUT	Job	CIM_ConcreteJob REF	See 8.1.6.
IN	TimeoutPeriod	Datetime	See 8.1.7.

379 8.1.1 Establishing a Pending Power State Change

380 The RequestPowerStateChange() method can be invoked with the Time parameter specified, which will
381 result in establishing the Pending Power State Change. The Pending Power State Change will be
382 reflected in the PowerOnTime and RequestedPowerState properties of the instance of
383 CIM_AssociatedPowerManagementService that references the CIM_PowerManagementService and the
384 instance of CIM_ComputerSystem that is represented by the ManagedElement parameter.

385 The TimeoutPeriod and Time parameters shall not be supported for the same invocation of the
386 RequestPowerStateChange() method. When the TimeoutPeriod and Time parameters are specified for
387 the same method invocation, the method shall return a value of 2.

388 When the method invocation is to establish the Pending Power State Change, the method may return the
 389 Job output parameter and return a value of 4096. When the method invocation returns the Job output
 390 parameter, the status of the referenced CIM_Job instance shall reflect the status of the attempt to
 391 establish the Pending Power State Change. When the method invocation does not return the Job output
 392 parameter, the method completion shall be synchronous with the establishment of the Pending Power
 393 State Change.

394 **8.1.2 Initiating an Immediate Power State Change**

395 The RequestPowerStateChange() method may be invoked without the Time parameter, which will result
 396 in the immediate initiation of a power state change. This section describes requirements for when the
 397 Time parameter is not specified.

398 When the method invocation is to initiate the Immediate Power State Change, the method may return the
 399 Job output parameter and a return code value of 4096. When the method invocation returns the Job
 400 output parameter, the status of the referenced CIM_Job instance shall reflect the status of the initiated
 401 power state change request. When the method invocation does not return the Job output parameter, the
 402 method completion shall be synchronous with the initiation of the Immediate Power State Change.

403 **8.1.3 PowerState**

404 The PowerState parameter indicates the desired power state of the computer system. When the value
 405 used for the PowerState parameter is not equal to one of the values in the PowerStatesSupported
 406 property array of the associated instance of CIM_PowerManagementCapabilities, the method shall return
 407 2. When the value used for the PowerState parameter is not equal to one of the values in the
 408 RequestedPowerStatesSupported property of the associated instance of
 409 CIM_PowerManagementCapabilities, the method shall return 2.

410 When the value 5 (Power Cycle (Off - Soft)) or the value 15 (Power Cycle (Off - Soft Graceful)) is
 411 supported for the PowerState parameter, the PowerChangeCapabilities property array of the associated
 412 instance of CIM_PowerManagementCapabilities shall contain the value 4 (Power Cycling Supported).

413 When the value 9 (Power Cycle (Off-Hard)) or the value 16 (Power Cycle (Off-Hard Graceful)) is
 414 supported for the PowerState parameter, the PowerChangeCapabilities property array of the associated
 415 instance of CIM_PowerManagementCapabilities shall contain the value 6 (Off Hard Power Cycling
 416 Supported).

417 When the values 10 (Master Bus Reset) or 11 (Diagnostic Interrupt (NMI)) are supported for the
 418 PowerState parameter, the PowerChangeCapabilities property array of the associated instance of
 419 CIM_PowerManagementCapabilities shall contain the value 7 (HW Reset Supported).

420 When the value 12 (Power Off - Soft Graceful), 13 (Power Off - Hard Graceful), 14 (Master Bus Reset
 421 Graceful), 15 (Power Cycle (Off - Soft Graceful)), or 16 (Power Cycle (Off - Hard Graceful)), is supported
 422 for the PowerState parameter, the PowerManagementCapabilities property array of the associated
 423 instance of CIM_PowerManagementCapabilities shall contain the value 8 (Graceful Shutdown
 424 Supported).

425 When the CIM_PowerManagementService.RequestPowerStateChange() method returns a value of 0 or
 426 4096, the RequestedPowerState property of the instance of CIM_AssociatedPowerManagementService
 427 that references the CIM_PowerManagementService instance and the CIM_ComputerSystem instance
 428 indicated by the ManagedElement parameter shall be set to the value of the PowerState parameter of the
 429 method.

430 The values of CIM_PowerManagementService.RequestPowerStateChange() method PowerState
 431 parameter shall have the meaning specified in Table 6.

432 **Table 6 – PowerState Parameter Values**

PowerState enum Value	Description
2 (Power On)	Initiate the transition of the system to full on state (corresponding ACPI state G0/S0).
3 (Sleep - Light)	Initiate the transition of the system to standby or sleep state (corresponding ACPI state G1/S1 or G1/S2).
4 (Sleep - Deep)	Initiate the transition of the system to standby or sleep state (corresponding ACPI state G1/S3).
5 (Power Cycle (Off Soft))	Transition the system to off state (corresponding ACPI state G2/S5), in which the system consumes a minimal amount of power, followed by a transition to on state (corresponding ACPI state G0/S0).
6 (Power Off - Hard)	Initiate the transition of the system to power off state (corresponding ACPI state G3), in which the power consumption is zero except for the real-time clock.
7 (Hibernate)	Transition the system to hibernation state (corresponding ACPI state G1/S4) – write system context to non-volatile storage, power off the system and devices.
8 (Power Off - Soft)	Initiate the transition of the system to off state (corresponding ACPI state G2/S5), in which the system consumes a minimal amount of power.
9 (Power Cycle (Off Hard))	Transition the system to power off state (corresponding ACPI state G3), in which the power consumption is zero except for the real-time clock, followed by a transition to on state (corresponding ACPI state G0/S0).
10 (Master Bus Reset)	Perform hardware reset on the system.
11 (Diagnostic Interrupt (NMI))	Assert an NMI on the system.
12 (Power Off - Soft Graceful)	Perform an orderly transition to power off state (corresponding ACPI state G2/S5), in which the system consumes a minimal amount of power.
13 (Power Off - Hard Graceful)	Perform an orderly transition to power off state (corresponding ACPI state G3), in which the power consumption is zero except for the real-time clock.
14 (Master Bus Reset Graceful)	Perform an orderly shutdown of the system followed by hardware reset.
15 (Power Cycle (Off - Soft Graceful))	Perform an orderly transition of the system to power off state (corresponding ACPI state G2/S5), in which the system consumes a minimal amount of power, followed by a transition to on state (corresponding ACPI state G0/S0).

PowerState enum Value	Description
16 (Power Cycle (Off - Hard Graceful))	Perform an orderly transition of the system to power off state (corresponding ACPI state G3), in which the power consumption is zero except for the real-time clock, followed by a transition to on state (corresponding ACPI state G0/S0).

434

435 **8.1.4 ManagedElement**

436 The ManagedElement parameter indicates the reference to the instance of CIM_ComputerSystem that
 437 represents the target computer system whose power state is to be set.

438 If the instance of CIM_ComputerSystem is not associated with the instance of
 439 CIM_PowerManagementService through the CIM_AssociatedPowerManagementService association, the
 440 RequestPowerStateChange() method shall return 2 (Error Occurred).

441 **8.1.5 Time**

442 The Time parameter is used to set the power state of the managed system at a certain time and can be
 443 used only to set the power state to On or Power Cycle. The Time parameter shall be supported when the
 444 PowerChangeCapabilities property array of the associated instance of
 445 CIM_PowerManagementCapabilities contains the value 5 (Timed Power On Supported). The Time
 446 parameter shall not be supported when the PowerState parameter has any value other than 2 (Power
 447 On), 5 (Power Cycle (Off Soft)) 9 (Power Cycle (Off Hard)), 15 (Power Cycle (Off-Soft Graceful)), or 16
 448 (Power Cycle (Off-Hard Graceful)). When the Time parameter is specified and is not supported, the
 449 method shall return a value of 2.

450 When the Time parameter is specified and the method returns a value of 0, the PowerOnTime property of
 451 the CIM_AssociatedPowerManagementService association that references the CIM_ComputerSystem
 452 instance identified by the ManagedElement parameter and references the
 453 CIM_PowerManagementService instance shall have the date-time value that indicates when the
 454 computer system will undergo the power state change indicated by the PowerState parameter. When the
 455 Time parameter complies with the interval format of the Datetime data type, the interval value indicated
 456 by the Time parameter shall be interpreted relative to the current date-time and the calculated absolute
 457 date-time shall be the value of the PowerOnTime property. When the Time parameter complies with the
 458 timestamp format of the Datetime data type, the PowerOnTime property shall have the value of the Time
 459 parameter.

460 When the Time parameter is either Null or 0, an immediate initiation of the power state change shall
 461 occur.

462 **8.1.6 Job**

463 The Job is an OUT parameter. It is a reference to the instance of CIM_Job that represents the job or task
 464 that may be started by the invocation of the RequestPowerStateChange() method.

465 The method may return the Job output parameter and a return code value of 4096 when the parameters
 466 for the method have been validated, regardless of whether the method will create a Pending Power State
 467 Change or an Immediate Power State Change.

468 **8.1.7 TimeoutPeriod**

469 The TimeoutPeriod parameter specifies the maximum amount of time that the client allows the
 470 RequestPowerStateChange() method to complete execution.

471 If the TimeoutPeriod parameter is specified and the value is not in the interval format of the Datetime data
 472 type, the method shall return a value of 2. If the TimeoutPeriod parameter is specified and the
 473 implementation is able to determine if the power state change will take more time than the TimeoutPeriod
 474 parameter, the method shall return a value of 2. A value of 0 or Null for the TimeoutPeriod shall indicate
 475 that no timeout requirements exist.

476 8.2 Profile Conventions for Operations

477 For each profile class (including associations), the implementation requirements for operations, including
 478 those in the following default list, are specified in class-specific subclauses of this clause.

479 The default list of operations is as follows:

- 480 • GetInstance
- 481 • Associators
- 482 • AssociatorNames
- 483 • References
- 484 • ReferenceNames
- 485 • EnumerateInstances
- 486 • EnumerateInstanceNames

487 8.3 CIM_PowerManagementService

488 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

489 NOTE: Related profiles may define additional requirements on operations for the profile class.

490 8.4 CIM_PowerManagementCapabilities

491 All operations in the default list in 8.2 shall be implemented as defined in [DSP0200](#).

492 NOTE: Related profiles may define additional requirements on operations for the profile class.

493 8.5 CIM_AssociatedPowerManagementService

494 Table 7 lists implementation requirements for operations. If implemented, these operations shall be
 495 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 7, all operations in
 496 the default list in 8.2 shall be implemented as defined in [DSP0200](#).

497 NOTE: Related profiles may define additional requirements on operations for the profile class.

498 **Table 7 – Operations: CIM_AssociatedPowerManagementService**

Operation	Requirement	Messages
ModifyInstance	Optional. See 8.5.1.	None
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

499 **8.5.1 CIM_AssociatedPowerManagementService—ModifyInstance**

500 When the ModifyInstance operation is supported for an instance of
 501 CIM_AssociatedPowerManagementService, the ModifyInstance operation shall not modify the following
 502 properties:

- 503 • PowerState
- 504 • OtherPowerState
- 505 • PowerOnTime
- 506 • RequestedPowerState

507 These properties can be affected by the invocation of the RequestPowerStateChange() method; see 8.1.

508 **8.6 CIM_ElementCapabilities**

509 Table 8 lists implementation requirements for operations. If implemented, these operations shall be
 510 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 8, all operations in
 511 the default list in 8.2 shall be implemented as defined in [DSP0200](#).

512 NOTE: Related profiles may define additional requirements on operations for the profile class.

513 **Table 8 – Operations: CIM_ElementCapabilities**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

514 **8.7 CIM_HostedService**

515 Table 9 lists implementation requirements for operations. If implemented, these operations shall be
 516 implemented as defined in [DSP0200](#). In addition, and unless otherwise stated in Table 9, all operations in
 517 the default list in 8.2 shall be implemented as defined in [DSP0200](#).

518 NOTE: Related profiles may define additional requirements on operations for the profile class.

519 **Table 9 – Operations: CIM_HostedService**

Operation	Requirement	Messages
Associators	Unspecified	None
AssociatorNames	Unspecified	None
References	Unspecified	None
ReferenceNames	Unspecified	None

520 **9 Use Cases**

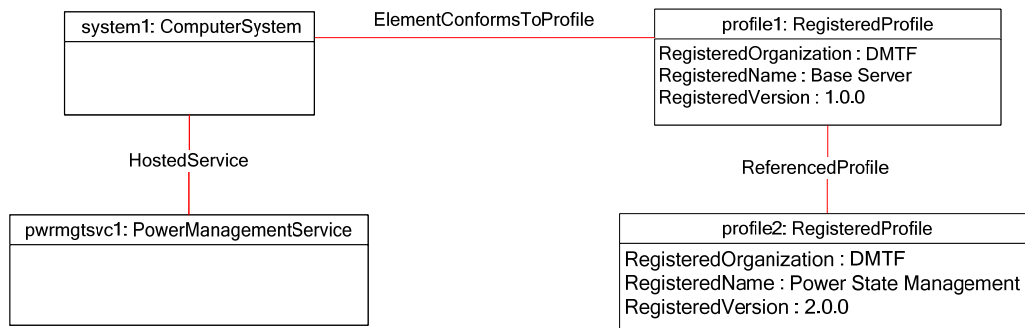
521 This section contains object diagrams and use cases for the *Power State Management Profile*.

522 **9.1 Object Diagrams**

523 This section contains object diagrams for the *Power State Management Profile*. For simplicity, the prefix
 524 CIM_ has been removed from the names of the classes in the diagrams.

525 **9.1.1 Advertising the Profile Conformance**

526 Figure 2 represents a possible instantiation of the *Power State Management Profile*. In this instantiation,
 527 the managed system, system1, hosts a power management service, pwrmtgsvc1. system1 is also the
 528 scoping instance for pwrmtgsvc1. Thus, following the CIM_ElementConformsToProfile association to
 529 profile1 and then the referenced CIM_ReferencedProfile association to profile2, the client can retrieve
 530 profile2. profile2 will show the version of the current *Power State Management Profile* implementation.

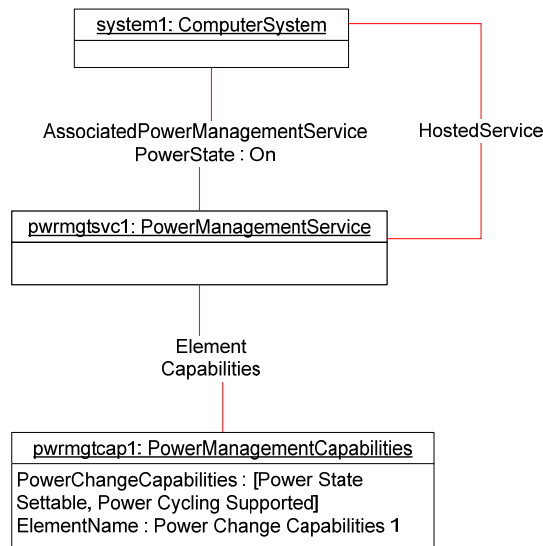


531

532 **Figure 2 – Registered Profile**

533 **9.1.2 Monolithic System**

534 Figure 3 shows the CIM instances required to control power for a single, monolithic system, system1.
 535 system1 hosts the power management service, pwrmtgsvc1, which manages the power for system1.



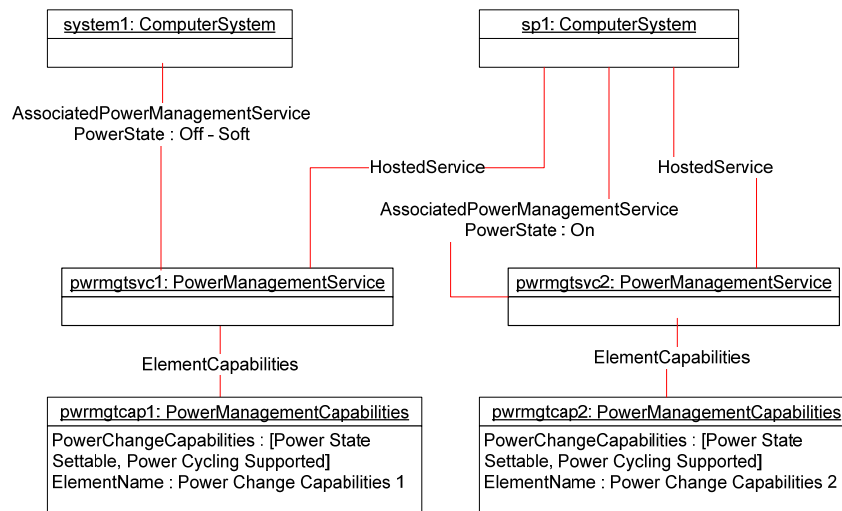
536

537 **Figure 3 – Power Control Instance Diagram: Monolithic System**

538 **9.1.3 Monolithic System with Service Processor**

539 Figure 4 shows the CIM instances required to control power for a monolithic system with an attached
 540 service processor. The power management service, pwrmtgsvc1, hosted by the service processor, sp1, is
 541 responsible for managing the power of the system, system1. Optionally, the service processor may host
 542 another power management service, pwrmtgsvc2, to control its own power.

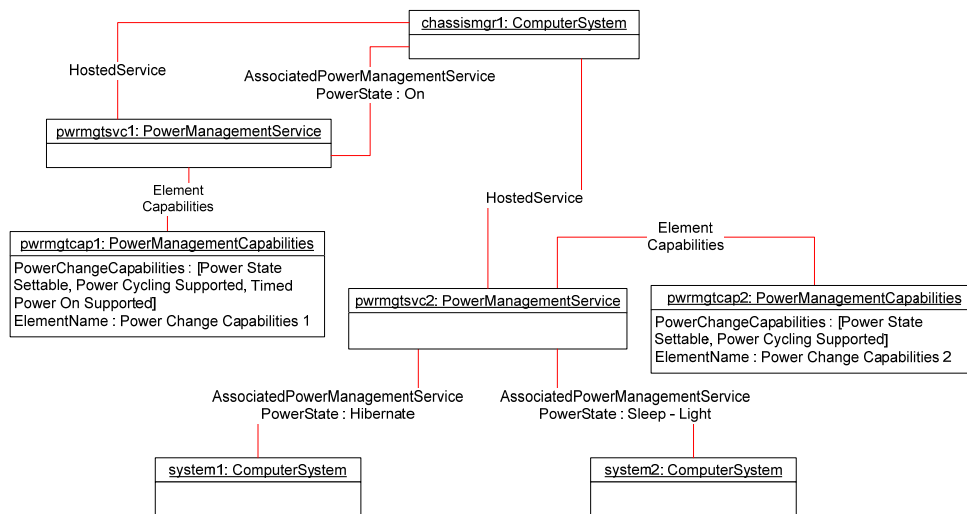
543 A service processor in this sense may be an add-in remote management component or an integrated
 544 baseboard management controller.



545
 546 **Figure 4 – Power Control Instance Diagram: Monolithic System with Service Processor**

547 **9.1.4 Modular System with Chassis Service Processor**

548 Figure 5 shows the CIM instances required to represent a modular computer system. The chassis
 549 manager, chassismgr1, hosts one or more power management services (pwrmtgsvc2) to control the
 550 power of all the blade systems. Optionally, the chassis manager may host another power management
 551 service (pwrmtgsvc1) to control its own power.



552
 553 **Figure 5 – Power Control Instance Diagram: Modular System with Chassis Service Processor**

554 **9.2 Determine the Power State of the Computer System**

555 A client can determine the power state of the computer system as follows:

556 For the instance of CIM_ComputerSystem that represents the given computer system, select the
557 referencing instance of CIM_AssociatedPowerManagementService.

558 The PowerState property of the referencing instance of CIM_AssociatedPowerManagementService
559 represents the power state of the computer system.

560 **9.3 Find the Power Management Service for a Computer System**

561 A client can find the power management service for a computer system as follows:

562 For the instance of CIM_ComputerSystem that represents the given computer system, select the instance
563 of CIM_PowerManagementService that represents the power management service for the computer
564 system through the CIM_AssociatedPowerManagementService association.

565 **9.4 Find All the Computer Systems for a Power Management Service**

566 A client can find all the computer systems for a power management service as follows:

567 For the instance of CIM_PowerManagementService that represents the given power management
568 service, select all of the instances of CIM_ComputerSystem that are associated with it through the
569 CIM_AssociatedPowerManagementService association.

570 **9.5 Change the Power State of the Computer System**

571 A client can change the power state of the computer system as follows:

- 572 1) Navigate from the target instance of CIM_ComputerSystem to the instance of
573 CIM_PowerManagementService that represents the service that manages that system by using
574 the CIM_AssociatedPowerManagementService association.
- 575 2) Invoke the RequestPowerStateChange() method of the instance of
576 CIM_PowerManagementService with an argument that contains the PowerState action
577 appropriate to the operation.

578 **9.6 Determine Whether the Power Cycle Is Supported for a Computer System**

579 A client can determine whether Power Cycle is supported for a computer system as follows:

- 580 1) Navigate from the target instance of CIM_ComputerSystem to the instance of
581 CIM_PowerManagementService using the CIM_AssociatedPowerManagementService
582 association.
- 583 2) Using the instance of CIM_PowerManagementService, navigate to the instance of
584 CIM_PowerManagementCapabilities through the CIM_ElementCapabilities association.

585 If the PowerChangeCapabilities property array contains the value 4 (Power Cycling Supported), Power
586 Cycle shall be supported for the computer system.

587 **9.7 Execute Power Cycle (Off-Soft) within a Given Time**

588 A client can execute Power Cycle (Off-Soft) within a given time as follows:

- 589 1) Navigate from the target instance of CIM_ComputerSystem to the instance of
 590 CIM_PowerManagementService using the CIM_AssociatedPowerManagementService
 591 association.
- 592 2) Invoke the RequestPowerStateChange() method of the instance of
 593 CIM_PowerManagementService with the Power State argument set to 5 (Power Cycle (Off-
 594 Soft)) and the TimeoutPeriod argument set to "t".

595 9.8 Execute Power Cycle (Off-Soft Graceful)

596 A client can determine whether Power Cycle and Graceful Shutdown is supported for a computer system
 597 as follows:

- 598 1) Navigate from the target instance of CIM_ComputerSystem to the instance of
 599 CIM_PowerManagementService using the CIM_AssociatedPowerManagementService
 600 association.
- 601 2) Using the instance of CIM_PowerManagementService, navigate to the instance of
 602 CIM_PowerManagementCapabilities through the CIM_ElementCapabilities association.

603 If the PowerChangeCapabilities property array contains the value 4 (Power Cycling Supported) and 8
 604 (Graceful Shutdown Supported), Power Cycle and Graceful Shutdown shall be supported for the
 605 computer system.

606 If the Power Cycle and Graceful Shutdown is supported, then a client can execute Power Cycle (Off-Soft
 607 Graceful) as follows:

- 608 1) Navigate from the target instance of CIM_ComputerSystem to the instance of
 609 CIM_PowerManagementService using the CIM_AssociatedPowerManagementService
 610 association.
- 611 2) Invoke the RequestPowerStateChange() method of the instance of
 612 CIM_PowerManagementService with the Power State argument set to 15 (Power Cycle (Off-
 613 Soft Graceful))

614 9.9 Display Power States That Can Potentially Be Requested

615 A client can display the potential power states that can be requested on the computer system as follows:

- 616 1) For the instance of CIM_ComputerSystem that represents the given computer system, select
 617 the referencing instance of CIM_AssociatedPowerManagementService.
- 618 2) Using the instance of CIM_PowerManagementService, navigate to the instance of
 619 CIM_PowerManagementCapabilities through the CIM_ElementCapabilities association.
- 620 3) The RequestedPowerStatesSupported property of the instance of
 621 CIM_PowerManagementCapabilities represents the power states that can potentially be
 622 requested on the computer system.
- 623 4) The CIM_AssociatedPowerManagementService.AvailableRequestedPowerStates property
 624 contains a subset of power state values from the
 625 CIM_PowerManagementCapabilities.RequestedPowerStatesSupported property. This subset
 626 represents currently available power state values for power state change requests, and it may
 627 change dynamically based on the current state of the computer system. A client application
 628 should use these properties to provide some visible differentiation between the available and
 629 unavailable power state values.

630 9.10 Determine the Available Power States That Can Be Requested

631 A client can determine the available power states that that can be requested on the computer system as
632 follows:

633 For the instance of CIM_ComputerSystem that represents the given computer system, select the
634 referencing instance of CIM_AssociatedPowerManagementService.

635 The AvailableRequestedPowerStates property of the referencing instance of
636 CIM_AssociatedPowerManagementService represents the power states that can be currently requested
637 on the computer system.

638 9.11 Change the Power State of the Computer System Based on Available Power 639 States

640 A client can change the power state of the computer system based on the current power state and the
641 available power states that can be requested as follows:

- 642 1) For the instance of CIM_ComputerSystem that represents the given computer system, select
643 the referencing instance of CIM_AssociatedPowerManagementService.
- 644 2) Navigate from the target instance of CIM_ComputerSystem to the instance of
645 CIM_PowerManagementService that represents the service that manages that system by using
646 the CIM_AssociatedPowerManagementService association.
- 647 3) Invoke the RequestPowerStateChange() method of the instance of
648 CIM_PowerManagementService with an argument that contains the PowerState with a value
649 that is one of the values in the AvailableRequestedPowerStates property of the
650 CIM_AssociatedPowerManagementService instance.

651 10 CIM Elements

652 Table 10 shows the instances of CIM Elements for this profile. Instances of the CIM Elements shall be
653 implemented as described in Table 10. Sections 7 ("Implementation") and 8 ("Methods") may impose
654 additional requirements on these elements.

655 **Table 10 – CIM Elements: Power State Management Profile**

Element Name	Requirement	Description
Classes		
PowerManagementCapabilities	Mandatory	See 7.2 and 10.1.
PowerManagementService	Mandatory	See 7.1 and 10.2.
AssociatedPowerManagementService	Mandatory	See 10.3.
ElementCapabilities	Mandatory	See 10.4.
HostedService	Mandatory	See 10.5.
RegisteredProfile	Mandatory	See 10.6.
Indications		
None defined in this profile		

656 **10.1 CIM_PowerManagementCapabilities**

657 CIM_PowerManagementCapabilities represents the power management capabilities of a computer
658 system. Table 11 contains the requirements for elements of this class.

659 **Table 11 – Class: CIM_PowerManagementCapabilities**

Elements	Requirement	Notes
InstanceID	Mandatory	Key
PowerChangeCapabilities	Mandatory	See 7.2.1.
ElementName	Mandatory	See 7.2.2.
PowerStatesSupported	Mandatory	See 7.2.3.
RequestedPowerStatesSupported	Mandatory	See 7.2.4.

660 **10.2 CIM_PowerManagementService**

661 CIM_PowerManagementService represents the power management service responsible for controlling
662 the power of a computer system. Table 12 contains the requirements for elements of this class.

663 **Table 12 – Class: CIM_PowerManagementService**

Elements	Requirement	Notes
CreationClassName	Mandatory	Key
Name	Mandatory	Key
ElementName	Mandatory	See 7.1.1.
RequestPowerStateChange()	Conditional	See 8.1.

664 **10.3 CIM_AssociatedPowerManagementService**

665 CIM_AssociatedPowerManagementService associates the CIM_ComputerSystem instance that
666 represents the target computer system with the CIM_PowerManagementService instance that represents
667 the service responsible for controlling the power of a computer system. Table 13 contains the
668 requirements for elements of this class.

669 **Table 13 – Class: CIM_AssociatedPowerManagementService**

Elements	Requirement	Notes
ServiceProvided	Mandatory	Key Cardinality 1
UserOfService	Mandatory	Key Cardinality *
PowerState	Mandatory	See 7.3.
RequestedPowerState	Conditional	See 7.4.
PowerOnTime	Conditional	See 7.4.
TransitioningToPowerState	Optional	See 7.5.
AvailableRequestedPowerStates	Optional	See 7.6.

670 **10.4 CIM_ElementCapabilities**

671 CIM_ElementCapabilities associates the CIM_PowerManagementService instance that represents the
 672 service responsible for controlling the power of a computer system with the
 673 CIM_PowerManagementCapabilities instance that represents the power management capabilities of a
 674 computer system. Table 14 contains the requirements for elements of this class.

675 **Table 14 – Class: CIM_ElementCapabilities**

Elements	Requirement	Notes
ManagedElement	Mandatory	This property shall be a reference to the instance of CIM_PowerManagementService. Cardinality 1..*
Capabilities	Mandatory	This property shall be a reference to the instance of CIM_PowerManagementCapabilities. Cardinality 1

676 **10.5 CIM_HostedService**

677 CIM_HostedService associates the CIM_ComputerSystem instance with the
 678 CIM_PowerManagementService instance that it hosts. Table 15 contains the requirements for elements
 679 of this class.

680 **Table 15 – Class: CIM_HostedService**

Elements	Requirement	Notes
Antecedent	Mandatory	This property shall be a reference to the instance of CIM_ComputerSystem. Cardinality 1..*
Dependent	Mandatory	This property shall be a reference to the instance of CIM_PowerManagementService. Cardinality *

681 **10.6 CIM_RegisteredProfile**

682 CIM_RegisteredProfile is defined by the [Profile Registration Profile](#). The requirements denoted in
 683 Table 16 are in addition to those mandated by the [Profile Registration Profile](#).

684 **Table 16 – Class: CIM_RegisteredProfile**

Elements	Requirement	Notes
RegisteredName	Mandatory	This property shall have a value of "Power State Management".
RegisteredVersion	Mandatory	This property shall have a value of "2.0.0".
RegisteredOrganization	Mandatory	This property shall have a value of 2 (DMTF).

685 NOTE: Previous versions of this document included the suffix "Profile" for the RegisteredName value. If
 686 implementations querying for the RegisteredName value find the suffix "Profile", they should ignore the suffix, with
 687 any surrounding white spaces, before any comparison is done with the value as specified in this document.

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ANNEX A (informative)

Change Log

Version	Date	Description
1.0.0b	2006/07/11	Preliminary Standard version.
1.0.0c	2007/01/30	Preliminary Standard refresh. Updated CIM schema version from 2.11 to 2.15 to reflect the correct schema that contains all the properties that the profile references.
1.0.0	2008/04/11	Final Standard version.
1.0.2	2008/12/12	Added RequestedPowerStatesSupported property to PowerManagementCapabilities.
2.0.0	2009-12-14	DMTF Standard Release. Added TransitioningToPowerState and AvailableRequestedPowerStates properties to CIM_AssociatedPowerManagementService. Fixed Table 3 on ACPI to PowerState property mapping. Added a table on the meaning of PowerState parameter of RequestPowerStateChange() method. Addressed PPP WG ballot and TC ballot comments.

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693